

REMARKS/ARGUMENTS

Claims 1-13 and 17-22 are active in this case. Support for Claims 18-22 is found in the specification at page 29, lines 14-33. Support for the amendment to Claim 17 is also found on page 29.

No new matter is believed to have been added by these amendments.

Applicants thank the Examiner for indicating that Claims 4-7 and 10-11 are drawn to allowable subject matter. In view of the amendments and remarks submitted in this paper, Applicants request allowance of all pending claims.

The rejection of Claim 16 under 35 USC 101 is obviated by the cancellation of the claim.

The rejection of Claims 16 and 17 under 35 USC 112, first paragraph is obviated by amendment. Specifically, Claim 16 has been cancelled and Claim 17 has been amended to recite the treatment of a bacterial infection, which the Examiner has already determined is enabled by the specification (see page 2 of the Office Action). Withdrawal of this rejection is requested.

The rejection of Claims 1-3, 8, 9, and 12-17 under 35 USC 112, second paragraph is respectfully traversed.

With respect to the comments regarding Claims 14, 15 and 16, it is noted that these claims have been cancelled.

With respect to the phrase "protecting group," it should be noted that protecting groups for amino and carboxyl moieties are well known and understood in this field. For example, the phrase "protecting group" is found as an entry in an on-line encyclopedia, "Wikipedia®" (a copy of this encyclopedia entry is attached). If deemed necessary by the Office, additional reference material could be provided that demonstrates the knowledge of

using protecting groups for organic synthesis. Moreover, the specification on pages 13-15 describes many different examples of protecting groups that can be used. Thus, the claims set out and circumscribe a particular subject matter with a reasonable degree of clarity and particularity in terms of what constitutes a "protected amino" and/or a "protected hydroxyl." (See MPEP § 2173.02).

Withdrawal of this ground of rejection is also requested.

Applicants also appreciate the returned signed copies of the Information Disclosure Statements that Applicant had filed. However, it is noted that the PTO Form 1449 submitted on January 30, 2004, while signed and partially initialed, had three references (AA, AW, and AX) that had not been initialed as having been considered. Accordingly, Applicants request another copy of the January 30, 2004 PTO Form 1449 with initials by all of the references indicating that they have been considered. Should the Examiner require additional copies of those reference, he is invited to contact the Applicants undersigned representative who will promptly provide those references. For convenience another copy of the January 30, 2004 IDS filing is attached.

Finally, Applicants request a Notice of Allowance for this application.

Respectfully submitted,

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Protecting group

From Wikipedia, the free encyclopedia.

A **Protecting group** or **protective group** is introduced into a molecule by chemical modification of a functional group in order to obtain chemoselectivity in a subsequent chemical reaction. It plays an important role in multistep organic synthesis.

In many preparations of delicate organic compounds, some specific parts of their molecules cannot survive the required highly reactive reagents and harsh chemical environments (extreme example: a boiling acid bath). Then, these parts, or groups, must be **protected**. For example, lithium aluminum hydride is a highly reactive but useful reagent capable of reducing esters to alcohols. It will always react with carbonyl groups, and this cannot be discouraged by any means. When a reduction of an ester is required in the presence of a carbonyl, the attack of the hydride on the carbonyl has to be prevented. For example, the carbonyl is converted into an acetal, which does not react with hydrides. The acetal is then called a **protecting group** for the carbonyl. After the step involving the hydride is complete, the acetal is removed (by reacting it with an aqueous acid), giving back the original carbonyl. This step is called **deprotection**.

Contents

- 1 Common protecting groups
 - 1.1 Alcohol protecting groups
 - 1.2 Amine protecting groups
 - 1.3 Carbonyl protecting groups
 - 1.4 Carboxylic acid protecting groups

Common protecting groups

Alcohol protecting groups

alcohol protecting groups are:

- A Tetrahydropyranyl ether (THP) - Removed by acid.
- A Methoxymethyl ether (MOM) - Removed by acid.
- A β -Methoxyethoxymethyl ether (MEM) - Removed by acid.
- A p-Methoxybenzyl ether (PMB) [1] (<http://www.chem.brown.edu/faculty/basu/PMB.pdf>) - Removed by acid or hydrogenolysis.
- A Methylthiomethyl ether - Removed by acid.
- A Silyl ether (most popular ones include trimethylsilyl (TMS), tert-butyldimethylsilyl (TBDMS), and triisopropylsilyl (TIPS) ethers) - Removed by acid or fluoride ion.

Amine protecting groups

amine protecting groups are:

- A Carbobenzyloxy group (Cbz) - Removed by hydrogenolysis
- A tert-Butyloxycarbonyl (BOC) group (Common in solid phase peptide synthesis) - Removed by concentrated, strong acid. (such as HCl or CF₃COOH)
- A 9-Fluorenylmethyloxycarbonyl group (Fmoc) (Common in solid phase peptide synthesis) - Removed by base.

Carbonyl protecting groups

carbonyl protecting groups are:

- Acetals - Removed by acid.
- Acylals - Removed by lewis acid

Carboxylic acid protecting groups

Carboxylic acid protecting groups are:

- Methyl esters - Removed by acid or base.
- Benzyl esters - Removed by hydrogenolysis.

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Category: Organic chemistry

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